

A METHOD AND APPARATUS FOR IDENTIFYING A SET OF MULTIPLE
ITEMS ON A CONVEYOR SYSTEM WITH MULTIREAD TRANSPONDERS

ABSTRACT OF THE DISCLOSURE

Apparatus including a conveyor for identifying a plurality of items each of which has a radio frequency transponder. A three dimensional (3D) radio frequency antenna is positioned on one side of the conveyor. The conveyor has a movable part for moving the items into and out of the antenna such that the items when in the antenna are completely surrounded by the antenna. A reader sends interrogation signals to the transponders via the antenna and reads identification information from the transponders. The 3D antenna includes a plurality of coils mounted in a 3D arrangement such as to provide a 3D reading field in which all transponders in the reading field may be interrogated. The 3D antenna also includes noise compensation coils at opposite ends of the reading field to minimize electromagnetic radiation from the antenna and also minimize noise from external sources affecting reading of the transponders. The radio frequency transponder includes a housing a substrate within the housing and a printed circuit board mounted on the substrate. A coil is mounted on the substrate such as to be spaced therefrom. The substrate, the printed circuit board, the integrated circuit chip and the coil are encapsulated with the spacing of the coil from the substrate enabling the encapsulant to completely surround the coil.